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PRESENCE DATA MANAGEMENT METHOD

INCORPORATION BY REFERENCE

This application claims priority based on a Japanese patent application, No. 2004-003599 filed on January 9, 2004, the entire contents of which are

5 incorporated herein by reference.

BACKGROUND OF THE INVENTION

The present invention relates to a data management method for a presence server which has centralized management for the presence information of

10 network users.

With the prevalence of IP networks, personal computers and information communication terminals in recent years, network systems supporting direct communication between individuals are being introduced

15 increasingly. Especially, systems storing information on ever-changing status of individuals and devices as presence information and providing the stored presence information to a terminal accessing the system have recently been in practical use. For example, U.S. Pat.

20 No. 6,389,127 discloses a mechanism for storing information on the statuses of telephone lines and providing information on usage status (busy condition) of a telephone line in response to an inquiry. The patent document explains the advantages of the

mechanism in that a call center, etc. can avoid making calls to busy lines and can give customers (currently on the lines) calls after they finished the telephone conversation.

5   Meanwhile, in some instant message systems that communicate instant messages via a server computer, statuses of users of terminals are registered with the instant message server under certain prescribed conditions. The prescribed conditions

10 include the start/finish of an instant message application installed in the terminal, the user's selection from a menu of the instant message application, etc. It is possible for each user to register with the server so as to permit the server to

15 disclose his/her status information (registered with the server) to other users of the instant message system. Users allowed to receive the status information (hereinafter referred to as "watchers") can watch the status information (stored in the server) of

20 the user who permitted the information disclosure by use of the instant message applications installed in their terminals. Each watcher can use the received status information for judging whether it is possible to make contact with the user (who permitted the

25 information disclosure) through the instant message system or other methods of communication.

        The "watchers" are a group of users of the instant message system that have been designated by a

registered user (user who has registered with the
instant message server) as the access right holders of
his/her status information. A record of the user group
(watchers) registered with the instant message server
5 by the function of the instant message server is called
"watcher list". Users registered with the watcher list
can include not only the designated user group but also
users living in a particular area, users who selected
the same hobby category in menu registration of the
10 instant message system, or all the users of the instant
message system.

Meanwhile, a record of a frequently
communicating user group (a group of users frequently
communicating with a particular user) registered with
15 the instant message server by the particular user for
reference is called "buddy list". The user can
classify the users on the buddy list into "private
groups" according to hobby, area, level of closeness,
etc. for convenience and register the private groups
20 with the server. The user can use the buddy list and
the private groups for designating the destinations in
the instant message application and other applications
for audio communication, video telecommunication, e-
mail, etc. The instant message application has
25 recently become capable of detecting usage statuses of
communication devices of the users, registering the
device usage status information with the server, and
disclosing the device usage status information to other

users of the system similarly to the disclosure of the
user status information.

Other than such simple status information of
the users, personal information such as full name and
5   hobby, multimedia information such as facial portrait,
voice, music and video can also be registered with the
instant message server directly or as links. Examples
of terminals in which the instant message application
can be installed in personal computers, cellular
10 phones, PDAs (Personal Digital Assistants), etc. The
instant message applications installed in the terminals
establish connection with the instant message server
computer by use of communications networks having
various bandwidths and communication characteristics,
15 such as wireless LANs, wired LANs, wireless packet
networks and ISDNs (Integrated Services Digital
Networks).

The users of the system can make access to
the instant message server not only from fixed
20 terminals but also from mobile terminals equipped with
the instant message application even when away from
home, on the road, in transit, etc.

SUMMARY OF THE INVENTION

As the communication between individuals has
25 become more and more popular, the function for managing
the user status information, device usage status
information, buddy lists and private groups, which used

to be a function of the instant message server of the
instant message system, is beginning to be supported as
an independent service. In such circumstances, a
system for managing the service and a server for
5   providing the service are beginning to be called
"presence system" and "presence server", and the
information on the user status and device usage status
of a user which is managed by the presence server and
disclosed to other users when permitted by the user is
10   called "presence information".

However, the usage of the presence
information (also called "referred information" still
has some room for improvement.

For example, a variety of information is
15   being registered as the presence information as
mentioned above, and the method for access to the
presence server and the network environment have
diversified. Therefore, when the presence information
of a user is referred to by a plurality of terminals,
20   presence information available to each terminal can
vary depending on supported functions and performance
of the terminal.

However, such difference of the supported
functions of the terminals are not taken into
25   consideration so far, and thus each terminal is
required to receive all types of presence data from the
server, select information of available types from the
received presence data, and present the selected

information to the user. The reception of unnecessary
presence information leads to waste of communication
resources, an excess processing load on the terminal,
etc.

5   Further, in cases where a user has been
registered with a plurality of private groups, if an
instant message or e-mail is transmitted by designating
the private groups containing the user as the
destinations, a plurality of same messages
10 (corresponding to the private groups) may be delivered
to the user, causing inconvenience to the user, waste
of communication resources, etc.

          The present invention provides a technique
for finely changing the method for processing messages
15 depending on the presence information of the users.

          For example, the present invention provides a
technique for processing and restricting the presence
information to be received by each terminal depending
on the terminal's supported functions.

20   Specifically, there is provided a technique
capable of reducing the amount of data to be processed
by the terminal of the user (in which the application
of the presence system has been installed) by reducing
the amount of presence data (data of the presence
25 information) delivered from the presence server to the
terminal by letting the presence server filter the
contents of the presence information to be delivered
depending on communication measures and data type

available to the terminal and discard part of the
presence information.

The present invention also provides a
technique capable of removing redundant user IDs and
5   eliminating redundant delivery of two or more messages
having the same contents to a user in cases where two
or more same user IDs exist in private groups and user
IDs designated as destination addresses.

In accordance with an aspect of the present
10   invention, the presence server acquires terminal
information which has been stored therein based on
terminal information contained in a presence inquiry
request message (presence information reference
request) from a user and thereby learns the type of
15   data that can be handled and processed by the terminal
of the user. Subsequently, the presence server
reconstructs the presence information of a referred
user (requested by the message) into presence
information that can be handled and processed by the
20   terminal, and sends the reconstructed presence
information to the presence system application of the
terminal.

By the above process, the server of the
presence system is allowed to transmit limited presence
25   information that matches the functions and performance
of the user terminal receiving the presence
information, by which telecommunication data size and
the processing load on the terminal (in which the

presence system application has been installed) can be reduced.

In accordance with another aspect of the present invention, the presence server temporarily expands destination addresses designated by a user into addresses of individual users. When one or more private groups are included in the destinations, the presence server temporarily expands the destinations into addresses of individual users and checks whether or not there exists an address of an individual user redundantly included in the destination addresses. If there exists an address of an individual user redundantly included in the destination addresses, the presence server removes the redundant addresses of the individual user and transmits the message to the individual user using only one address.

By the above process, the server of the presence system is prevented from transmitting two or more same messages to a terminal (in which the presence system application has been installed), by which communication efficiency of the server increases. Further, each user is saved from receiving redundant messages with a terminal and thereby inconvenience to the user can be avoided.

By the present invention, proper and efficient use of the presence information can be realized without the need of wasting communication resources.

These and other benefits are described throughout the present specification. A further understanding of the nature and advantages of the invention may be realized by reference to the remaining

5 portions of the specification and the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the composition of a presence system in accordance with an

10 embodiment of the present invention;

Fig. 2 is a block diagram showing an example of the composition of a presence server 20 employed for the embodiment;

Fig. 3 is a block diagram showing an example

15 of the composition of presence information which is employed in the presence system of the embodiment;

Fig. 4 is a block diagram showing an example of the composition of a group list of a user 11 employed in the presence system of the embodiment;

20 Fig. 5 is a functional block diagram explaining a filtering process which is conducted when presence information is referred to in the embodiment;

Fig. 6 is a flow chart showing a process conducted by a database access unit 144 of the

25 embodiment;

Fig. 7 is a flow chart showing the details of a filtering function 492 of the embodiment;

Fig. 8 is a flow chart showing a process for removing redundant addresses when private groups are used as destinations in the embodiment;

Fig. 9 is a table showing the composition of a watcher list employed in the presence system of the embodiment;

Fig. 10 is a table showing the contents of "supported media" in the presence information employed in the embodiment;

Fig. 11 is a flow chart showing the details of a media performance matching process 501 of the embodiment; and

Fig. 12 is a flow chart showing the details of a terminal-supported media judgment process 519 of the embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Referring now to the drawings, a description will be given in detail of a preferred embodiment in accordance with the present invention, wherein like reference characters designate like or corresponding parts throughout the views.

This embodiment relates to a method for supplying a user with presence information which is managed by a presence server 20 having the system configuration shown in Fig. 1, and a method for expanding a group address of a private group into addresses of individual users.

In the presence system shown in Fig. 1, the
presence server 20, personal computer 14 and 15, and a
wireless mobile terminal 16 are connected together by a
network including the Internet 30, an ISP network 32,
5 an access point 18, a wireless backbone network 34,
etc.

An application program of the presence system
has been installed in the personal computers 14 and 15
and the wireless mobile terminal 16. The application
10 program is executed by the CPU (Central Processing
Unit) of each device, by which the functions of the
application program are implemented.

Presence information lists 23 and group lists
21 have previously been registered with the presence
15 server 20 by the user 10 of the personal computer 14
and the user 12 of the wireless mobile terminal 16. It
is assumed that the user 12 of the wireless mobile
terminal 16 has already permitted the disclosure of
his/her status information (presence information) to
20 the user 10. Each watcher list 24 is generated by the
presence server 20 in response to a request from a
user. The watcher lists 24 are generated as service
for the users of the presence system.

The "PRESENCE INFORMATION ACQUISITION 1" from
25 the presence server 20 by the user 10 shown in Fig. 1
is carried out by the following process.

The user 10 previously registers a status
information notification request (requesting the status

information (presence information) of the user 12) with
the presence server 20 via the ISP network 32 using
his/her personal computer 14.   Specifically,
identification information (identity) of the user 10 is
5   registered with the watcher list 24 associating with
identity of the user 12 as a key.

     The composition of the watcher list 24 will
be described later referring to Fig. 9.   Incidentally,
a user who refers to the presence information of other
10   users as in this explanation will hereinafter be
referred to as "watcher".   In this state, the user 12
registers the change of his/her status with the
wireless mobile terminal 16.   The wireless mobile
terminal 16 registers "PRESENCE INFORMATION
15   REGISTRATION 1" (indicating the presence information of
the user 12) with the presence information list 23 of
the presence server 20 via the access point 18, the
wireless backbone network 34, the Internet 30 and the
ISP network 32.   The presence server 20 searches the
20   watcher list 24 for the watchers of the status
information (presence information) of the user 12 in
response to the arrival of the "PRESENCE INFORMATION
REGISTRATION 1" of the user 12 and the update of the
presence information list 23 of the user 12.   In the
25   example of Fig. 9, the user 10 is found as the watcher,
therefore, the presence server 20 transmits a presence
information message (indicating the status of the user
12 has changed) to the personal computer 14 of the user

10 via the ISP network 32.

Next, the usage of a private group when a user 11 sends a message will be explained referring to the same Fig. 1.

5   The user 11 (with the personal computer 15) receives his/her group list 21 (listing a plurality of private groups of the user 11) and addresses of frequently referred individual users, etc. when the user 11 starts using the presence system.

10   The user 11 uses one or more of the private groups listed on a copy 22 of the group list 21 (received using the personal computer 15) as the destinations of the message he/she sends. The destinations will hereinafter be referred to as

15 "destination(s) from the user 11".

On sending the message, the user 11 transmits the message itself and information on the private group(s) (selected from the copy 22 of the group list 21 of the user 11) from the personal computer 15 to the

20 presence server 20 via the ISP network 32.

In response to the arrival of the message and the "destination(s) from the user 11", the presence server 20 transmits the message from the user 11 to all the "destination(s) from the user 11". On the

25 transmission of the message, since the "destination(s) from the user 11" includes one or more private groups of the user 11, the presence server 20 expands the destination(s), that is, translates group addresses of

the private group(s) of the "destination(s) from the
user 11" into individual addresses of individual users
contained in the private group(s).

The presence server 20 expands the
5   destination(s) by searching the group list 21 of the
user 11 (group list 21 registered with the presence
server 20) for the corresponding private group(s) and
acquiring all the destination addresses of the users of
the presence system contained in the private group(s),
10 and then transmits the message from the user 11 to all
the destinations (destination addresses) acquired by
the expansion of the "destination(s) from the user 11".

Fig. 9 is a table showing an example of the
watcher list 24. The watcher list 24 of this example
15 has a tabular form, in which a first column 240
indicates "referred users" (users whose presence
information is referred to) and the latter columns 242
indicate the watchers. Since there can be a plurality
of watchers, the latter columns 242 for a referred user
20 includes as many columns as the watchers of the
referred user. In each of the columns, information
identifying the user of the presence system (generally,
a user name) is registered.

If the user 10 sends a notification request
25 for the status information (presence information) of
the user 12 to the presence server 20, the presence
server 20 registers the user 10 as a watcher with a sub
field 252 of the field (latter columns) 242 of a line

250 of the user 12. While the user 10 in this example
is registered at the front end (since there are no
other users as watchers), if some watchers have already
been registered, the user 10 is registered following
5   the sub fields of the already registered watchers.
Meanwhile, if the user 10 sends a notification
cancellation request regarding the status information
(presence information) of the user 12 to the presence
server 20, the presence server 20 deletes the sub field
10   252 (indicating the user 10) from the field 242 of the
line 250 of the user 12.

        Fig. 2 is a block diagram showing an example
of the composition of the presence server 20. The
presence server 20 is implemented by an information
15   processing device including a CPU 100, memory 102, a
local storage device 104, a communication unit 106 and
an I/O unit 108 connected together by a common signal
line 110. The functions of the presence server 20
described in this embodiment are realized by a program
20   loaded on the memory 102 and executed by the CPU 100.
The main body of the presence server program, addresses
and presence information of the users of the presence
system, and the group lists are stored in the local
storage device 104.

25   The program may either be prestored in the
local storage device 104 or introduced to the local
storage device 104 via an available detachable record
medium or a network (or a carrier wave propagating on

the network) as needed.

The personal computers 14 and 15 and the wireless mobile terminal 16 also have composition similar to the composition explained above.

5   Although not shown in Fig. 2, the addresses, presence information and the group lists of the users of the presence system may also be stored in an external database which is connected to the presence server 20. In this case, the presence server program
10   executed by the CPU 100 accesses not only the local storage device 104 but also the external database.

When the presence server program is executed, the communication unit 106 receives data which are transmitted from the presence system application
15   (installed in the terminals of the users) via the communication network (Internet 30, etc.) while transmitting data (obtained by the execution of the presence server program on the CPU 100) to the users' terminals (operated by the presence system
20   applications) via the communication network such as the Internet 30.

In the case where the database is external to the presence server 20 and the presence server program run on the CPU 100 utilizes the external database, the
25   presence server 20 communicates data necessary for the operation of the service of the presence system (e.g. the addresses, presence information and the group lists of the users of the presence system) with the external

database. The I/O unit 108 interfaces with a keyboard, a mouse, a display, etc.

Fig. 3 is a block diagram showing an example of the composition of the presence information employed in the presence system which has been explained referring to Fig. 1. As mentioned above, the presence information is generated by the user's operation of the terminal and the registration with the presence server. The presence information of a user is composed of "Identity 201" corresponding to the user and "Agents (211, 221, 231)" as devices of the user in which the presence system application is installed.

In Fig. 3, Agent 211 of a personal computer, Agent 221 of a PDA and Agent 231 of a cellular phone are shown as examples of separate devices. In the real world, each Agent can be used by two or more users and the users can change. Therefore, the relationship between the Identity and Agents can change dynamically in the presence system, and they are associated with each other by dynamic links in order to define and indicate the relationship.

The Identity 201 is defined by static attributes 202 and dynamic attributes 203. The static attributes 202 indicate characteristics of the user that do not change much during the use of the presence system. Examples of the static attributes 202 include personal information (full name, date of birth, blood type, address, nickname, etc.), Identity name which is

unique in the presence system, the group list and the
buddy list.

The dynamic attributes 203, including the
presence 204, indicate characteristics of the user that
5   tend to change during the use of the presence system.
Examples of the dynamic attributes 203 include statuses
of the individual user like "on the job", "on a break"
and "in transit". Examples of the presence 204 include
information indicating methods for making contact with
10 the user ("direct contact (telephone, etc.) OK", "e-
mail OK", "contact not allowed", etc.) and information
indicating the user's feelings ("busy", "dull", etc.).

Similarly to the Identity 201, each Agent
(211, 221, 231) is also defined by static attributes
15 and dynamic attributes. When the Agent 211 is a fixed
(stationary) device such as a desktop personal
computer, examples of the static attributes 212 include
the IP address, the type and version number of the
presence system application, the presence or absence of
20 a GPS receiver for measuring the position, and
supported media 213. The supported media 213 mean
audio/voice input-output devices, picture/video/CG
(Computer Graphic) input-output devices, etc. that are
available to the presence system application and
25 cooperative applications of the Agent 211.

Fig. 10 shows a table 270 indicating the
contents of the supported media 213. The table 270 is
composed of two columns: a column 271 indicating a

media attribute and a column 273 indicating a type of
the media attribute. Lines 280 through 282 of the
table show combinations of the media attributes and the
types. For example, the line 280 shows the support of
5 audio media (for speech) and its type.

Examples of the dynamic attributes 214 of the
Agent 211 include whether the Agent 211 is in use or
not and the presence 215 of the Agent 211. Examples of
the presence 215 include usage status of the supported
10 media 213. Although the contents of the Agents 221 and
231 are almost the same as those of the Agent 211,
location information may be included in the dynamic
attributes 234 since the device is a mobile terminal.
The location information can be acquired by well known
15 techniques. For example, the location information may
be acquired by the Agent that is equipped with a GPS
receiver or the current position of the Agent may be
detected from wireless access point information.

Fig. 4 is a block diagram showing an example
20 of the composition of the group list of the user 11 in
the presence system explained referring to Fig. 1. The
group list 306 is managed by use of tree structure of
the private groups. In this example, a private group
300 is placed at the top (root) of the tree structure,
25 and private groups 340 and 360 are associated
downwardly with the private group 300.

Each private group has a group ID that is
unique in the presence system, a group name, and a

parent group ID. The private group 340 has a group ID 341, a group name 342 and a parent group ID 343, for example.

The group ID 341 of the private group 340 is "3" which is unique in the presence system, and its parent group ID 343 is "1" denoting the private group 300. While the private groups 300 and 360 also have similar attributes, the private group 300 at the top (root) of the tree structure has a parent group ID 303 "0" indicating that it has no parent private group.

Next, an example of the composition of the private group 360 will be explained referring to Fig. 4. The private group 360 has group elements 370 and 374. Here, the group element 370 will be explained as an example.

The group element 370 includes a group ID 371 of a private group it belongs and an Identity name 372 indicating a user of the system. The Identity name 372 is associated with a user element 378. The user element 378 includes an Identity name 379 (that is the same as the Identity name 372) and a nickname 380 to be displayed by the presence system application.

Incidentally, the Identity names 372 and 379 are names that are used for the Identity name ("Identity") of the static attributes 202 which has been explained referring to Fig. 3. The presence server program searches for the group list and the presence information by use of the Identity name. The

group element 374 has similar composition. The private

groups 300 and 340 also have composition similar to

that of the private group 360.

In the example of Fig. 4, the user indicated

5   by the Identity name "aaa" is shown in two user

elements 322 and 378. This means that the user

indicated by the Identity name "aaa" belongs to both

the private groups 300 and 360 of the user 11.

Similarly, the user indicated by the Identity name

10   "ccc" belongs to both the private groups 300 and 340 of

the user 11.

Fig. 5 is a functional block diagram

explaining a filtering process which is conducted by

the presence server 20 when the personal computer 14 of

15   the user 10 refers to the presence of the user 12.

Referring to Fig. 5, a reception unit 132

receives a presence information update request message

from outside. A transmission unit 134 transmits the

presence information of users (after completing the

20   filtering process) to outside. The two units are

installed in a communication unit 130. A header

analysis unit 140 analyzes the header of the presence

information update request message supplied from the

reception unit 132 and thereby checks the Identity name

25   of the user (Identity name of the user 12 in this

example), the type of the message, the type of the

Agent (terminal) used by the user (the type for the

wireless mobile terminal 16 in the presence system),

consistency of the message, etc.

A message analysis unit 142 analyzes the body
of the message after the header analysis by the header
analysis unit 140 and thereby checks the presence

5   information of the user requesting registration (the
presence information of the user 12 in this example).
A database access unit 144 makes access to a database
121 according to the result of analysis by the header
analysis unit 140 and the message analysis unit 142 and

10   thereby updates the presence information 122 of the
user 12 (presence information list 23 shown in Fig. 1)
while searching the watcher list 22 for the watcher
(user referring to the presence information of the user
12). Subsequently, the database access unit 144 spots

15   the watcher's agent from the presence information 123
of the watcher using the Identity name and Agent type
of the watcher (obtained by the search) as keys, and
thereby learns the supported media of the watcher's
agent.

20   The supported media of each Agent can be
judged from the specific Identity name and the Agent
name of the Identity as explained referring to Fig. 3.

A filter processing unit 148 carries out the
filtering process so as to select proper information

25   (that can be handled by the functions of the Agent of
each watcher) from the updated presence information of
the user 12 based on information supplied from the
database access unit 144. In this example, the user 10

is the only watcher.

Fig. 6 is a flow chart showing a process conducted by the database access unit 144 and the filter processing unit 148 of Fig. 5.

5   While the explanation of Fig. 5 was given using the particular name "user 12", in this explanation, the user of the presence system sending the presence information update request message will be generalized as "user A".

10   First, when a presence update event occurs (when the database access unit 144 receives the presence information update request message from the user A) (step 480), the presence server program updates the presence information of the user A stored in the

15   database (step 481) and outputs a presence information update notification message to be sent to the terminal of the user A to a transmission queue (step 482).

Subsequently, a watcher information list of the user A is read out from the database using the

20   Identity name of the user A as a key (step 484). Each piece of watcher information is successively extracted from the watcher information list (step 486) and whether the list is vacant or not is judged (step 488). If the list is vacant (488: YES), the process is

25   finished (step 498). If there exists watcher information in the watcher information list (488: NO), the filtering process is executed by a filtering function (step 492) and the processed message is

outputted to the transmission queue bound to the transmission unit 134 (step 494).

Thereafter, the pointer of the watcher information list is moved to the next (step 496) and the process is returned to the step 486 for extracting another piece of information from the watcher information list.

By the process, each of the watchers referring to the presence information of the user A can be notified of the update of the presence information of the user A, except when the presence information of the user A (to be transmitted to the watcher) is totally removed by the filtering function of the step 492.

Part of the presence information of the user A that is removed by the filtering function of the step 492 is presence information that can not be handled by the watcher's agent. The server program does not transmit the presence information that can not be processed by the Agent (terminal) of the watcher, by which the amount of data received and processed by the terminal can be reduced.

Fig. 7 is a flow chart showing the details of the filtering function 492 shown in Fig. 6.

In the filtering function 492, in order to send the presence information of the user A to the terminal of the watcher, the presence information of the user A is copied first (step 401) and whether there

exists information on the watcher's agent is checked (step 402). If there exists no information, the presence information of the user A (as it is) is directly copied to the transmission buffer as presence

5   information to be transmitted to the watcher (step 404) and the process is ended (step 410). If there exists information on the watcher's agent, a media performance matching process (step 501) is carried out and the process is ended (step 410). The media performance

10 matching process will be explained below referring to Fig. 11.

Fig. 11 is a flow chart showing the details of the media performance matching process (step 501). First, in order to process (pick up) the presence

15 information of the user A in a way matching the performance (functions) of the terminal of the watcher, a temporary working buffer (temporary work area) for storing the processed presence information is initialized (step 503).

20 Subsequently, in order to refer to the presence information of the user A having the list structure shown in Fig. 3, the top (front end) of the list is referred to (step 505). Whether there exists an element of the presence information (presence

25 information element) in the referred part of the list is checked (step 507). If no presence information element is found (507: NO), it is judged that no more presence information element to be referred to exists

or remains, and the contents of the temporary working
buffer (storing the processed presence information are)
are copied to the transmission buffer (step 509) and
the process is ended (step 511).

5   If a presence information element of the user
A is found in the step 507, whether the element has a
media attribute or not is checked (step 513). The
media attribute is the one which has been explained
referring to the column 271 of Fig. 10. If no media
10 attribute is found (513: NO), the presence information
element is judged to be unrelated to the media. In
this case, the presence information element is added to
the contents of the temporary working buffer (step 515)
and the process is returned to the step 507 while
15 referring to the next presence information element
(step 517).

        If a media attribute is found (513: YES), a
terminal-supported media judgment (for judging whether
the media attribute is supported by the terminal of the
20 watcher) is carried out (step 519). The details of the
terminal-supported media judgment will be explained
below referring to Fig. 12. Thereafter, the process is
returned to the step 507 while referring to the next
presence information element (step 517).

25   Fig. 12 is a flow chart showing the details
of the terminal-supported media judgment process (step
519) shown in Fig. 11. In the process 519, whether or
not the media attribute contained in the presence

information element of the user A is supported by the media attribute of the terminal of the watcher is judged.

Concretely, the media attribute in the presence information element of the user A is classified first (step 521). If the media attribute can not be classified under media attributes that are supported by the presence server, the media attribute is regarded as "default" (to be handed over as it is to the terminal). In this case, the presence information element is added to the contents of the temporary working buffer (step 551) and the process is ended (step 523).

If the media attribute in the presence information element of the user A is classified in the step 521 into "speech", the media attribute of the Agent in the presence information of the watcher is searched for to judge whether or not the same item ("speech") is found (step 525). If the same item is not found (525: NO), the process is ended (step 523).

If the same item is found in the media attribute of the watcher's agent (525: YES), whether the "type" of the media attribute is supported or not is judged (step 527). If the type is not supported (527: NO), the process is ended (step 523).

If the type of the media attribute is supported (527: YES), the presence information element is added to the contents of the temporary working

buffer (step 529) and the process is ended (step 523).

Also for "audio", "image", "video" and "graphics" shown in the step 521 of Fig. 12, a process similar to the above process for "speech" is carried

5 out.

By the processes explained above, the presence system is allowed to carry out the notification of presence information so as to match the functions and performance of the terminal of each

10 watcher.

As described above, by letting the presence server 20 discard part of the contents of the presence information to be distributed to the watcher depending on the communication functions and data type available

15 to the terminal of the user (watcher), the amount of presence data (data of the presence information) transmitted from the presence server 20 to the terminal can be reduced and thereby the amount of data to be processed by the terminal can be cut down.

20   In the following, a destination expansion process regarding private groups (translating group addresses of private groups into individual destination addresses), which is conducted when a message from the user 11 is transmitted and distributed by the presence

25 server program (program of the presence server 20), will be explained referring to Fig. 8 and Fig. 4.

When the private groups 300 and 340 shown in Fig. 4 are designated by the user 11 as the

destinations of the message, a user indicated by the Identity name "ccc" is redundantly designated as the destinations. The presence server program conducts the following process in order to avoid the redundant

5 designation of destinations.

When a message distribution event for the user 11 occurs (step 460), each destination is read out from a destination address list one by one while checking whether or not it is the end of the list (step

10 462).

If it is not the end of the destination address list (462: NO), the presence server program judges whether or not the destination read from the list is a private group (private group address) of the

15 user 11 (step 472). If the destination is a private group (472: YES), the presence server program expands the private group address into individual addresses (step 474) and stores the individual addresses in the temporary working buffer (step 476).

20 If the destination is not a private group of the user 11 (472: NO), the presence server program judges that the destination is an individual address, and stores the address (as it is) in the temporary working buffer (step 476).

25 Subsequently, the presence server program moves the reference pointer of the destination address list by one (step 478), returns to the step 462, and thereafter repeats the above process until the end of

the destination address list. If the process has reached the end of the destination address list (462: YES), the presence server program executes the sorting of the individual addresses stored in the temporary

5 working buffer (step 464), removes redundant individual addresses (step 466), outputs the message and the individual addresses stored in the temporary working buffer to the transmission queue (step 468), and ends the process (step 470).

10   By the above process, overlapping and redundant individual addresses can be removed when a user of the presence system designates his/her own private groups as the destinations of the message, by which redundant transmission of messages from the

15 presence server 20 can be eliminated and thereby the traffic (telecommunication data size) in the presence system and the amount of data to be processed by the terminals of message receivers can be reduced considerably.

20   As described above, in cases where two or more same user IDs exist in the private groups and user IDs designated as the destination addresses, redundant user IDs can be removed and redundant delivery of two or more messages having the same contents to a user can

25 be eliminated.

        The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense. It will, however, be evident

that various modifications and changes may be made thereto without departing from the spirit and scope of the invention as set forth in the claims.